Dhanekula Institute Of Engineering & Technology

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COMPUTER SCIENCE ENGINEERING

Tomorrow's World Through Today's Education

DEPARTMENT OF Computer Science

THE Leaflet

NEWSLETTER

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issue. 5 (FEB-MAR)

NEWS LETTER

Principal's Message

Dear Parents and Students,

It is with great pleasure that I welcome you to our College (DIET) Newsletter.

As Principal I am hugely impressed by the commitment of the college and the staff in providing an excellent all-round education for our students with our state of the art facilities. We as a team working together, strongly promote the zeal towards academic achievement among our students. The cultural, sporting and other successes of all our students and staff are also proudly celebrated together.

I congratulate the staff and students who brought latest technologies and concepts onto the day to day teaching learning platform. As long as our ideas are expressed and thoughts kindled we can be sure of learning, as everything begins with an idea.

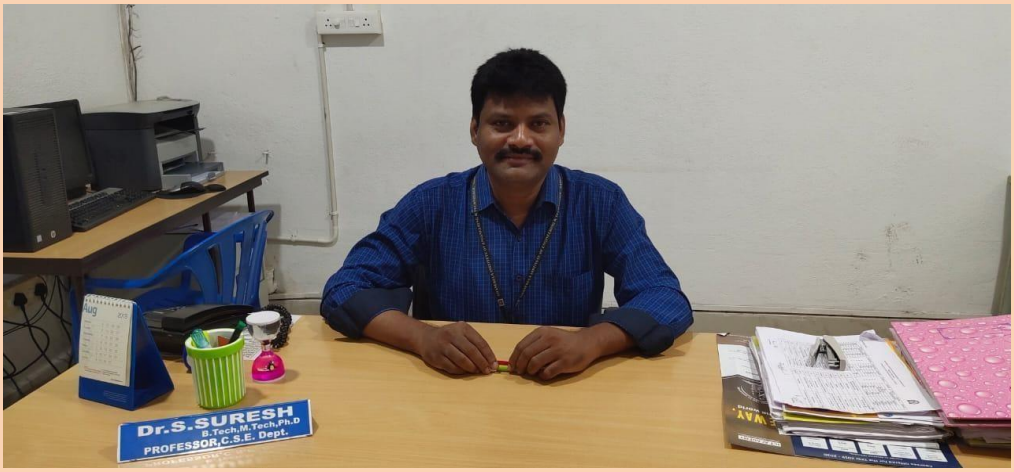
I appreciate every student who shared the joy of participation in co-curricular and extracurricular activities along with their commitment to curriculum. That little extra we do, is the icing on the cake. 'Do more than belong – participate. Do more than care – help. Do more than believe – practice. Do more than be fair – be kind. Do more than forgive – forget. Do more than dream – work.'

With a long and rewarding history of achievement in education behind us, our DIET community continues to move forward together with confidence, pride and enthusiasm.

I hope you enjoy your visit to the website and should you wish to contact us, please find details at the www.diet.ac.in/

Yours in Education,
Dr.Ravi Kadiyala
Principal

Message From HOD



Greetings from the Department of CSE, Dhanekula Institute of Engineering & Technology, Vijayawada.!!!!

"It is a pleasure to be the head of the department of CSE. The department offers B-Tech (CSE) and M-Tech (CSE). The department has a team of highly experienced and motivated faculty members who are in process of tuning the young minds to make them globally competitive. The department is equipped with state-of-the-art laboratories where students can enhance their knowledge and skill. The strength of the department is highly motivated students who understand the dynamics of the industry and upgrade their skills accordingly. The scope of computer science is endless. The students of the computer science and engineering are highly demanded by the recruiters of the top companies. Depending upon the interest of the student, he/she may choose to go for higher studies or if employed can choose to do research, development, design, production, application, testing or management in the Information Technology industry. In our department we not only give emphasis on study but also apply our knowledge in understanding what computers are, how to efficiently program them, different tools and technologies, the interface between the computer and the user, the computer graphics, computer networking, managing the database, software engineering and testing them efficiently and more. Through innovative teaching-learning process a teamwork approach and leadership building experience, our students gain vital communication and critical-thinking skills. Our institution provides a platform for the students to enhance their employability skills through Industry Institute Collaboration."

I, Congratulate the team of faculty members and the students for their brilliant and original efforts. I wish all the Students and Faculty a great academic career.

Dr. S. Suresh Professor & HOD,
Computer Science and Engineering,
Dhanekula Institute of Engineering &Technology,
vijayawada- - 531 139.

Department Vision: To empower students of Computer Science and Engineering Department to be technologically adept, innovative, global citizens possessing human values.

Department Mission:

To Encourage students to become self-motivated and problem solving individual To prepare students for professional career with academic excellence and leadership skills. To Empower the rural youth with computereducation. To Create Centre's of excellence in Computer Science and Engineer

Program Educational Objectives(PEOs):

PEO1: Excel in Professional career through knowledge in mathematics and engineering principles.

PEO2: Able to pursue higher education and research.

PEO3: Communicate effectively, recognize, and incorporate societal needs in their professional endeavors.

PEO4: Adapt to technological advancements by continuous learning.

DEPARTMENT ACTIVITIES:

PROJECT EXHIBITION was organized by the Department of Computer Science & Engineering, on 19th Feb, 2020. Final year students are participating in this exhibition The Major objective of organizing this exhibition was to provide the platform and unleash the potential of the students by showcasing their innovative projects developed in the Final Year either as Industry Defined Problem or User Defined Problem and provide an opportunity for the students to demonstrate their learning experience. PROJECT EXHIBITION held in the institution proves to be a great platform for such students and for the presentation of their talent. The students speak about their projects in front of everyone and develop public speaking skills. It boosts the confidence of the students and outshines their personality. The inaugural of the project exhibition witnessed the presence of Dr. Ravi Kadiyala, principal, DIET, along with the faculty and staff members of Department of CSE, DIET. Prof. Suresh S, HOD, CSE Department formally welcomed the principal of DIET, Dr. Ravi Kadiyala, principal, DIET, in his motivational address emphasized on the importance of learning new technologies and tools for the students. Prof. Suresh S, HOD, CSE, shared his valuable knowledge among the students highlighting the importance of project making.

Motivational Speech by @Dr.T.Hanuman Chowdary

Dr.T.Hanuman Chowdary is the author of former Information Technology Advisory to the Government of Andhra Pradesh. he addressed the students of 3rd yr cse and he gave his valuable speech for students on recent technology updation.

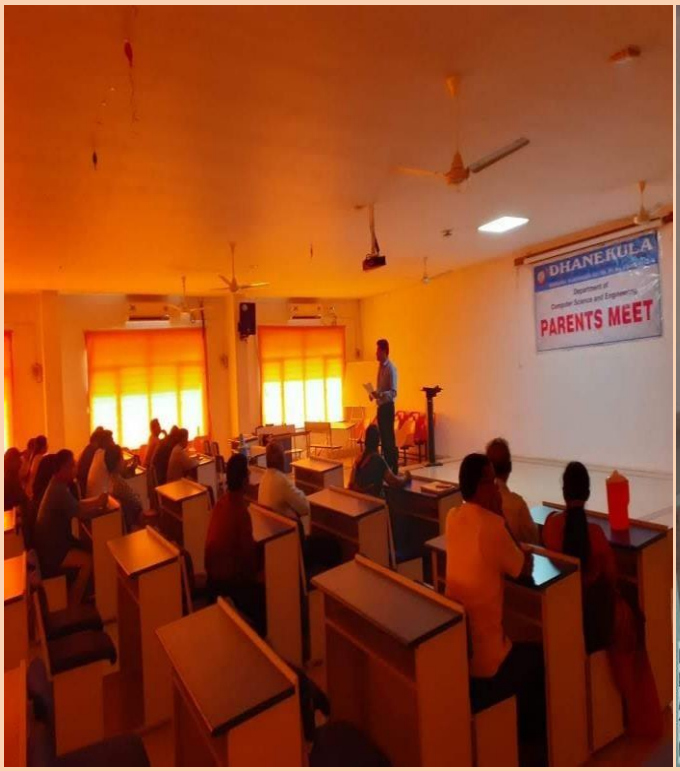
farewell party

Farewell Day Celebrations 3rd year students of cse gave Farewell for final year students on march 15th 2019. final year students share their lot of academic experiences

PARENTS MEET

The Department of Computer Science Engineering had conducted a PARENTS MEET on 15-02-2020 for 2nd, 3rd and 4th year students of CSE. The Parents meet was conducted at the CSE department seminar hall which started at 02:00 PM and completed by 04:30 PM.

Head of the Department Dr. S. Suresh, addressed the parents for an hour addressing different activities, policies and procedures following in the department with an insight on students class tests, remedial tests, R&D activities, Coding club activities, Association Activities and also on the different placement and training activities in the department and different certification courses imparted and also about the industry interaction via Internships, industrial visits later parents interacted with the respective class in charges, counselors and the subject teachers and collected suggestions and feedback forms from parents.



STUDENTS ARTICLES

Eye Ring

Abstract

Finger-worn interfaces are a vastly unexplored space for interaction design. It opens a world of possibilities for solving day-to-day problems, for visually impaired people and sighted people. In this work we present **Eye Ring**, a novel design and concept of a finger-worn device. We show how the proposed system may serve for numerous applications for visually impaired people such as recognizing currency notes and navigating, as well as helping sighted people to tour an unknown city or intuitively translate signage.

The ring apparatus is autonomous, however it is counter parted by a mobile phone or computation device to which it connects wirelessly, and an earpiece for information retrieval. Finally, we will discuss how finger worn sensors may be extended and applied to other domains.

INTRODUCTION:

Despite the attention finger-worn interaction devices have received over the years, there is still much room for innovative design. Earlier explorations of fingerworn interaction devices (some examples are shown in Figure 1) may be divided into a few subspaces according to how they are operated: Pointing [1], [2]; Tapping/Touching [3–5]; Gesturing [3], [6–8]; Pressing/Clicking On-Device [9]. Firstly, we wish to make the distinction between pointing gestures with the finger touching the object and pointing in free air. Our system is based on performing Free-air Pointing (FP) gestures, as well as Touch Pointing (TP) gestures. TP gestures utilize the natural touch sense, however the action trigger is not based on touch sensitivity of the surface, rather on an external sensor. Pointing devices based on TP gestures, as a reading aid for the blind date back to the Optophone and later the Optacon1.

However, the rise of cheap and small photo-sensory equipment, such as cameras, revolutionized the way low-vision people read or interact with visual interfaces. Recently Chi et al presented Seeing With Your Hand [10], a glove apparatus that uses TP gestures. Other assistive devices that are using imaging technology but not TP gestures are Primpo's iSONIC2 and the i-Cane3 which act both as a white cane and as a visual assistant that can tell the ambient lighting condition and colors of objects. The haptic element of TP gestures is interesting especially in the case of assistive technologies for the visually impaired. This enables them to get additional feedback on the object they want to interact with.

FP gestures on the other hand, are rooted in human behavior and natural gestural language. This was shown to be true by examining gestural languages of different cultures [11]. Usually FP gestures are used for showing a place or a thing in space - a passive action. However, augmenting FP for information retrieval is an interesting extension. Previous academic work in the field of FP gestures, revolved around control [2] and information retrieval [1]. These works and others utilize a specialized sensor, usually an infrared connection, between the pointing finger and the target. This implies the environment to be rigged especially for such interaction. We chose to use a generalized approach by using a general-purpose camera. This choice breaks the bonds of dimensionality of a single signal source or sensor, as well as the bonds of wavelength as it operates in the wider, visible spectrum.

(a) Symbol's *WSS 1000*

(b) Optical Finger Mouse

(c) The *Optacon II*

The desire to replace an impaired human visual sense or to augment a healthy one had a strong influence on the design and rationale behind EyeRing. Most of the work around FP and some TP gestures (e.g. the Optical Finger Mouse) are aimed towards sighted people. At the initial stage of this project, we chose to focus on a more compelling aspect of exploring how visually impaired people may benefit from finger-worn devices. In this paper, we describe the EyeRing prototype, a few applications of EyeRing for visually impaired people and some future possibilities. Finally we discuss our plans of extending this work beyond the assistive interfaces domain.

Our proposed system is composed of a finger-worn device with an embedded camera, a computation element embodied as a mobile phone, and an earpiece for information loopback. The finger-worn device is autonomous and wireless, and includes a single button to initiate the interaction. Information from the device is transferred to the computing element where it is processed, and the results are transmitted to the headset for the user to hear. Overview of the EyeRing system is shown in (Figure 2). The current implementation of finger-worn device uses a TTL Serial JPEG Camera, 16 MHz AVR processor, a bluetooth module, 3.7V polymer Lithium-ion battery, 3.3V regulator, and a push button switch.

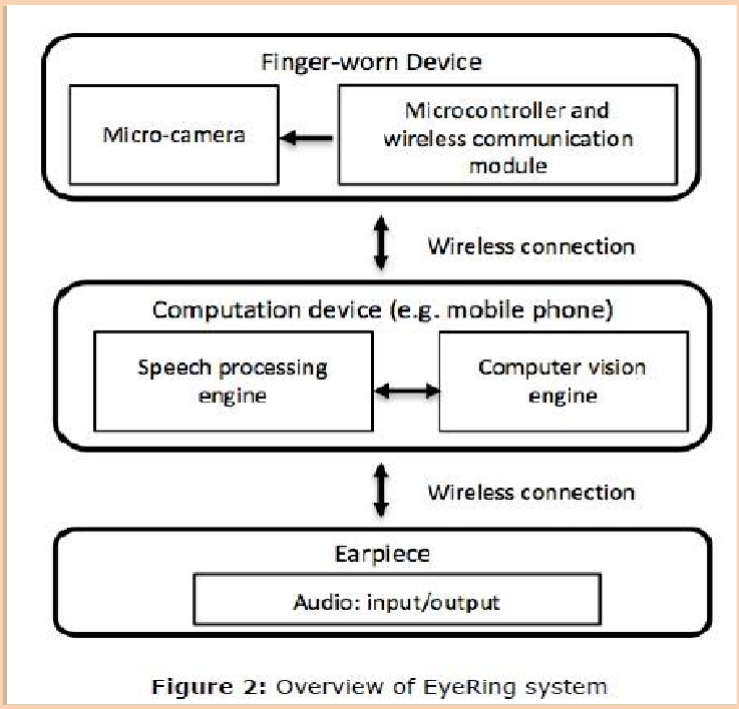


Figure 2: Overview of EyeRing system

These components are packaged into a wearable ABS nylon casing (Figure 3). Speech processing engine and computer vision engine were implemented on a mobile phone running Android 2.2. A user needs to pair the finger-worn device with the mobile phone application only once and henceforth a Bluetooth connection will be automatically established when both are running. A visually impaired user indicated this as an essential feature. Typically, a user would single click the pushbutton switch on the side of the ring using his thumb (Figure 4). At that moment, a snapshot is taken from the camera and the image is transferred via bluetooth to the mobile phone. An Android application on the mobile phone then analyzes the image using our computer vision engine. Type of analysis and response depends on the preset mode (color, distance, currency, etc.). Upon analyzing the image data, the Android application uses a Text-to- Speech module to read out the information though a headset. Users may change the preset mode by double- Figure 2: Overview of EyeRing system clicking the pushbutton and giving the system brief verbal commands such as "distance", "color", "currency", etc., which are subsequently recognized.

Applications For The Visually Impaired

The task of replacing the optical and nervous system of the human visual sense is an enormous undertaking. Thus, we choose to concentrate on learning the possible interaction mechanics for three specific scenarios outlined in this section.

1. Virtual Walking Cane:

Compared to a steel cane, a finger-worn device used for navigation is certainly less obtrusive, as well as fashionable and appealing. The essence of this application is to provide an approximate estimation of the clear walking space in front of the holder of the ring. Users must use FP gestures to take pictures of the space in front of them, by pointing the camera and clicking, with some motion between the shots. In a continuous-shooting mode (video), which is currently not supported in our prototype, there is no need for repeated clicking.

The system clearly notifies the approximate free space in front. For this application, we employ the concept of Structure from Motion (SfM). Upon receiving the two images, an algorithm to recover the depth is performed. The general outline of the algorithm is as follows: (a) the two images are scanned for salient feature points and then affine-invariant descriptors are calculated for them, (b) the features in both images are matched into pairs, (c) the pairs are used to get a dense distance map from the location of the camera in the first photo [12], (d) we use a robust method to fit a model of a floor to the data, and return the distance of the clear walking path in front. By repeatedly taking photos with motion, equivalent of moving a steel cane, we check the recovered 3D mapping of the floor and objects for any obstacles in the way of the user. Figure 5 outlines the above process.

2. Currency Detector:

This application is intended to help the user to identify currency bills (1$, 5$, 10$, 20$, 100$) to aid with payments. The interaction process is simple; a user would simply point index finger to a currency note (using a TP gesture then moving the finger back) and click the button. The system will voice out what the note is (Figure 6). A detection algorithm based on a Bag of Visual Words (BoVW) approach [13] scans the image and makes a decision on the type of note it sees. We use Opponent Space [14] SURF features to retain color information, for notes detection. Our vocabulary was trained to be of 1000 features long, and we use a 1-vs.-all SVM approach for classifying the types of notes. For training we used a dataset of 800 images using k-fold crossvalidation, and 100 images withheld for testing. As of writing these lines the overall recognition rate is over 80% with a 0.775 kappa statistic.

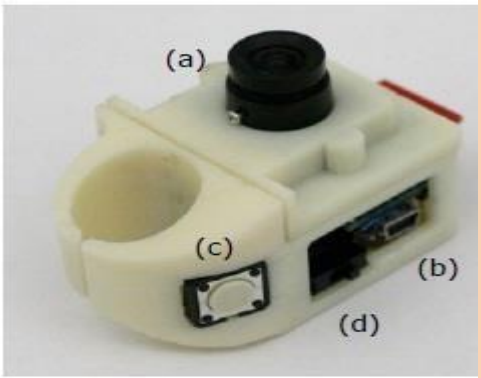


Figure 3: EyeRing prototype. The case was 3D printed with ABS nylon, and the electronics fit completely inside the skeletal compartment. (a) VGA mini camera, (b) Mini-USB port for recharging and reprogramming, (c) Trigger button, (d) On/Off switch.

3. Color Detector:

This application of EyeRing aids a visually impaired person to understand the color of an object. Again, the user interaction is simple; users simply touch point (TP gesture) to an object and click the button on the ring to deliver an image for processing (Figure 7). The system analyses the image and returns the average color via audio feedback. We use a calibration step to help the system adjust to different lighting conditions. A sheet of paper with various colored boxes is printed, and a picture of it is taken. We rectify the region in the image so that it aligns with the colored boxes, and then extract a sample of the pixels covering each box. For predictions we use a normal distribution, set to the maximum likelihood of the perceived color.

Future Applications

Eye Ring is still very much a work in progress. Future applications using EyeRing rely on more advanced capabilities of the device, such as real-time video feed from the camera, higher computational power, and additional sensors like gyroscopes and a microphone. These capabilities are currently in development for the next prototype of EyeRing.

Reading Non-Braille:

Visually impaired people are mostly bound to reading Braille or listening to audio books. However the amount of written material that are in Braille or audio transcribed is limited. The fact remains that natural interaction in our world requires decent visual abilities for reading. This application will allow the visually impaired to read regular printed material using EyeRing. The user simply touches the printed surface with the tip of the finger (TP gesture) and moves along the lines. Naturally, a blind person cannot see the direction of the written lines. For that reason we plan to implement an algorithm to detect the misalignment between the movement of the finger and the direction of the text, correcting the user's movement using the audio feedback

Tourist Helper:

We plan to extend EyeRing applications to domains beyond assistive technology. For example, tourists visiting a new city often rely on maps and landmarks for navigation. Recently, locationing systems, inertial sensors and compasses in mobile devices, and readily available dense mapping of most major cities, replaced the usage of paper maps. However, even with augmented reality applications such as Layar4, the UI for on-foot navigation is still cumbersome. Our proposed application relies on a much more natural gesture, such as simply pointing at the wanted landmark, asking "What is that?" and hearing its name.

Conclusion

Eye Ring suggests a novel interaction method for both visually impaired and sighted people. We choose to base the interaction on a human gesture that is ubiquitous in any language and culture – pointing with the index finger. This has determined the nature and design of the ring apparatus, location of the camera and

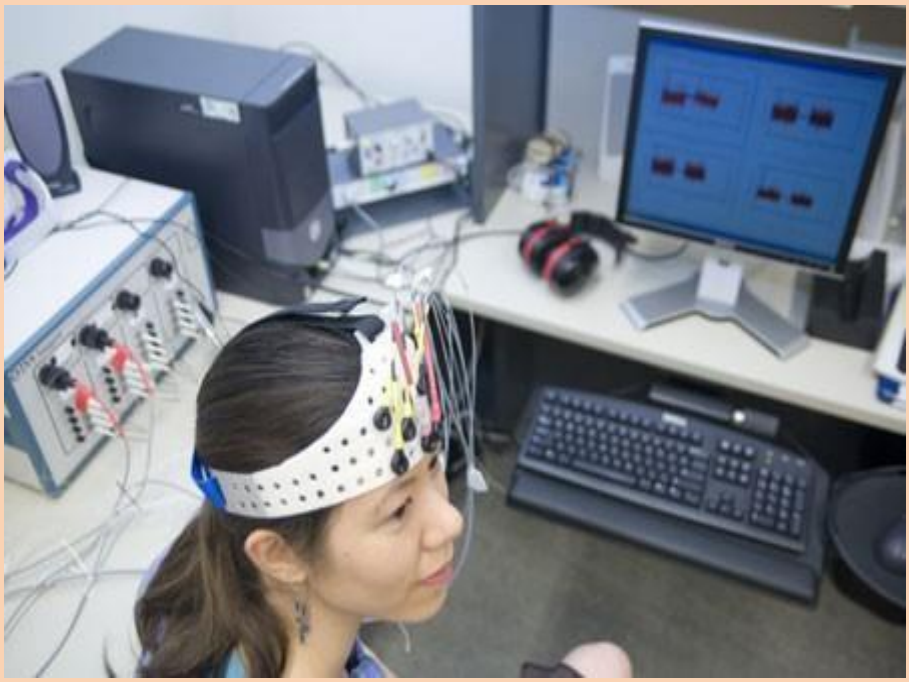
trigger. The applications we presented for Eye Ring emerge from the current design. Preliminary feedback received from a visually impaired user supports that Eye Ring assistive applications are intuitive and seamless. We are in the process of conducing a more formal and rigorous study to validate this. One of the biggest challenges is creating the supporting software that works in unison with this unique design.

Krishna Sai,3nd CSE
(178T1A0525)

MIND READING COMPUTER

Why mind reading?

The mind-reading computer system presents information about your mental state as easily as a keyboard and mouse present text and commands. Imagine a future where we are surrounded with mobile phones, cars and online services that can read our minds and react to our moods.
How would that change our use of technology and our lives? We are working with a major car manufacturer to implement this system in cars to detect driver mental states such as drowsiness, distraction and anger. Current projects in Cambridge are considering further inputs such as body posture and gestures to improve the inference. We can then use the same models to control the animation of cartoon avatars. We are also looking at the use of mind-reading to support on-line shopping and learning systems.
The mind-reading computer system may also be used to monitor and suggest improvements in human-human interaction. The Affective Computing Group at the MIT Media Laboratory is developing an emotional-social intelligence prosthesis that explores new technologies to augment and improve people's social interactions and communication skills.



How does it work?

The mind reading actually involves measuring the volume and oxygen level of the blood around the subject's brain, using technology called functional near-infrared spectroscopy (fNIRS).
The user wears a sort of futuristic headband that sends light in that spectrum into the tissues of the head where it is absorbed by active, blood-filled tissues. The headband then measures how much light was not absorbed, letting the computer gauge the metabolic demands that the brain is making.
The results are often compared to an MRI, but can be gathered with lightweight, non- invasive equipment.
A computer program which can read silently spoken words by analyzing nerve signals in our mouths and throats, has been developed by NASA.
Preliminary results show that using button-sized sensors, which attach under the chin and on the side of the Adam's apple, it is possible to pick up and recognize nerve signals and patterns from the tongue and vocal cords that correspond to specific words.
"Biological signals arise when reading or speaking to oneself with or without actual lip or facial movement," says Chuck Jorgensen, a neuroengineer at NASA's Ames Research Center in Moffett Field, California, in charge of the research. Just the slightest movement in the voice box and tongue is all it needs to work, he says.

Web search

For the first test of the sensors, scientists trained the software program to recognize six words - including "go", "left" and "right" - and 10 numbers. Participants hooked up to the sensors silently said the words to themselves and the software correctly picked up the signals 92 per cent of the time.
Then researchers put the letters of the alphabet into a matrix with each column and row labeled with a single-digit number. In that way, each letter was represented by a unique pair of number co-ordinates. These were used to silently spell "NASA" into a web search engine using the program.

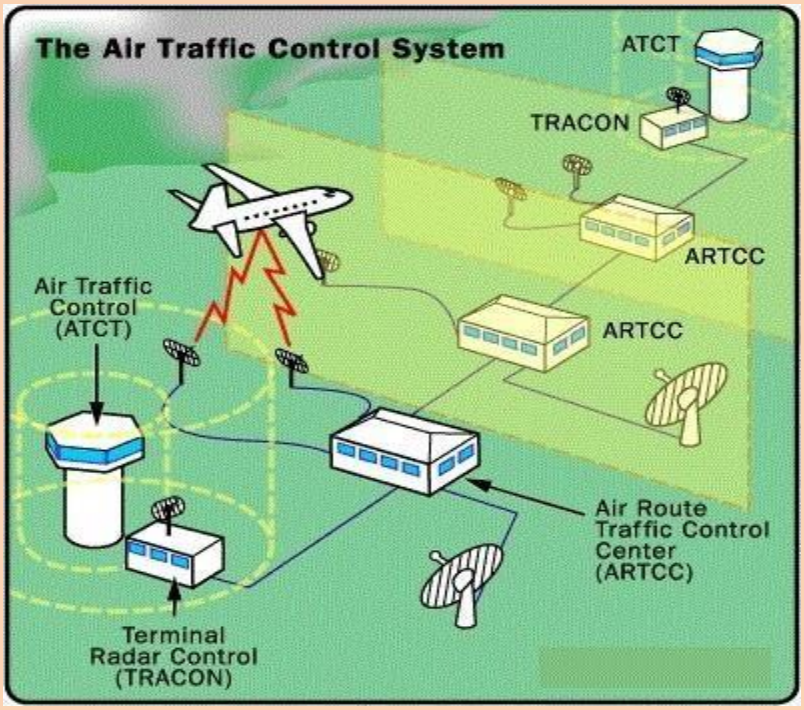
shiva (178T1A0540),3rd CSE-A

Air Traffic Control System

Air traffic control systems are various aircraft navigation and communication systems that uses computers, radar, radios and other instruments and devices to provide guidance to flying aircraft. Trained personnel working as air traffic controllers at stations on the ground constantly monitor these systems and track the locations and speed of individual aircraft. Controllers can warn aircraft should they come too close to each other. The goal of air traffic control system is to minimize the risk of aircraft collisions while maximizing the number of aircraft that can fly safely at the same time. Air traffic control systems also provide updated weather information to airport around the country, so aircraft can take off and land safely. This information is important not only to airline passengers but also to industries that rely on aviation for the timely transport of goods, materials and personnel.

Air traffic control (ATC) is a service provided by ground-based controllers who direct aircraft on the ground and through controlled airspace, and can provide advisory services to aircraft in non-controlled airspace. The primary purpose of ATC worldwide is to prevent collisions, organize and expedite the flow of traffic,

and provide information and other support for pilot's .In some countries, ATC plays a security or defensive role, or is operated by the military.



To prevent collisions, ATC enforces traffic separation rules, which ensure each aircraft maintains a minimum amount of empty space around it at all times. Many aircraft also have collision avoidance systems, which provide additional safety by warning pilots when other aircraft get too close.

In many countries, ATC provides services to all private, military, and commercial aircraft operating within its airspace. Depending on the type of flight and the class of airspace, ATC may issue instructions that pilots are required to obey, or advisories (known as flight information in some countries) that pilots may at their discretion, disregard. Generally the pilot in command is the final authority for the safe operation of the aircraft and may in an emergency, deviate from ATC instructions to the extent required to maintain safe operation of their aircraft. Air traffic control systems are various aircraft navigation and communication systems that use computers, radar, radios, and other instruments and devices to provide guidance to flying aircraft. Trained personnel working as air traffic controllers at stations on the ground constantly monitor these systems and track the locations and speeds of individual aircraft. Controllers can warn aircraft should they come close to each other. Air traffic control system is also used for the safe coordination of landing and takeoffs at airport.goal of air traffic control is to minimize the risk of aircraft collisions while maximizing the number of aircraft that can fly safely at the same time. Aircraft pilots and their onboard flight crews work closely with controllers to manage air traffic. Air traffic control systems also provide updated weather information to airport around the country, so aircraft can take off and land safely. This information is important not only to passengers but also to industries that rely on aviation for the timely transport of goods, materials and personnel.

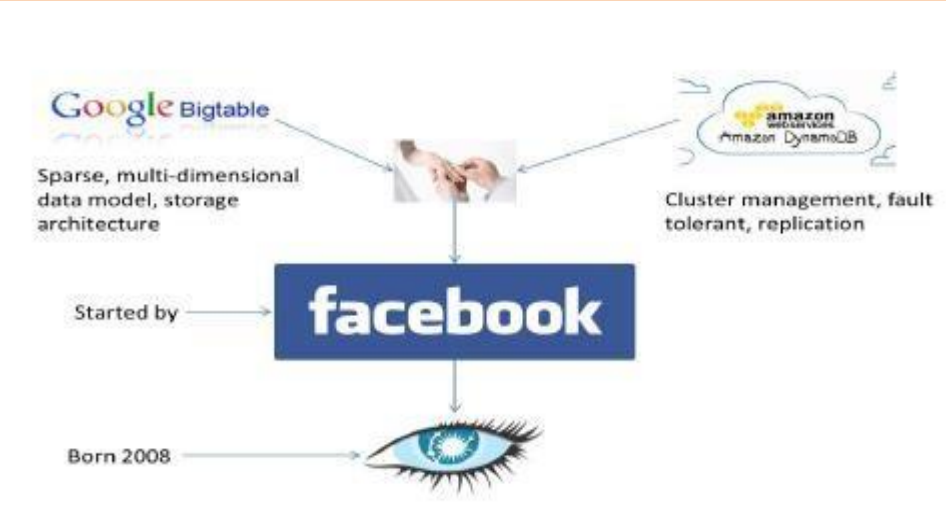
The go **Dhanujay**
(178T1A0545)
3rd CSE-A

FACE BOOK CASSANDRA

Cassandra is a column oriented, eventually consistent, distributed storage system for managing very large amounts of structured data. The Cassandra system was designed to run on cheap commodity hardware and handle high write throughput while not sacrificing read efficiency.

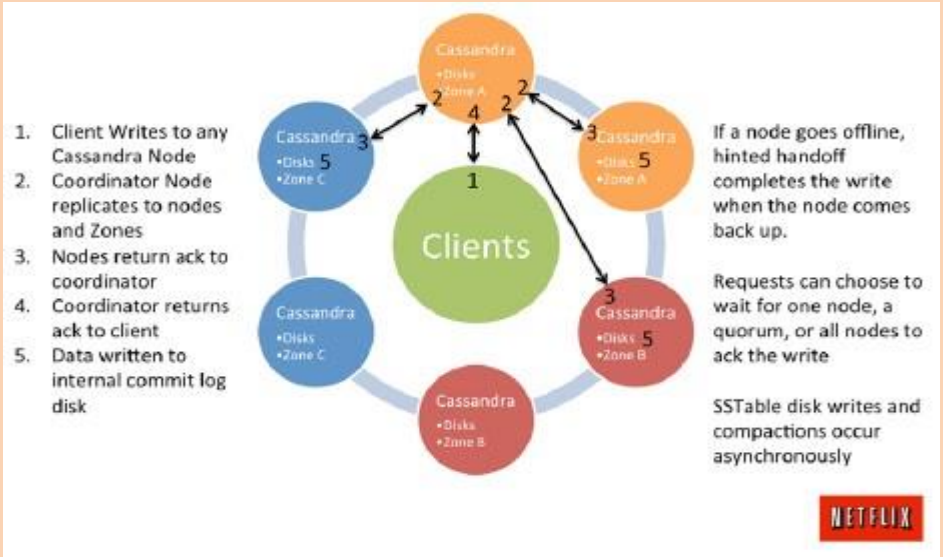
What is eventually consistent?

Building reliable distributed systems on a global scale demands trade-offs between consistency and availability .Consistency in a nutshell means that when something is written, it is expected that all reads after the write will have access to that written data. In Cassandra, due to its distributed nature, there are no such hard guarantees. However, we can say that it eventually reaches a consistent state because all data is eventually replicated across the distributed data store.



Cassandra was designed with the understanding that system/hardware failures will and do occur. Due to this, Cassandra was developed as a peer to peer distributed system where all nodes serve the same functions, meaning there is no single point of failure. One of Cassandra's greatest strength is its availability and scaling, it achieves this through a fully distributed system where data is replicated across multiple nodes according to user settings.

Data reading and writing is abstracted away from the application, which allows the application to read/write to any node in the system and always expect that the data is replicated across multiple nodes. According to the tunable consistency setting, the user can also achieve complete consistency, a compromise of consistency and speed, or little to no consistency.

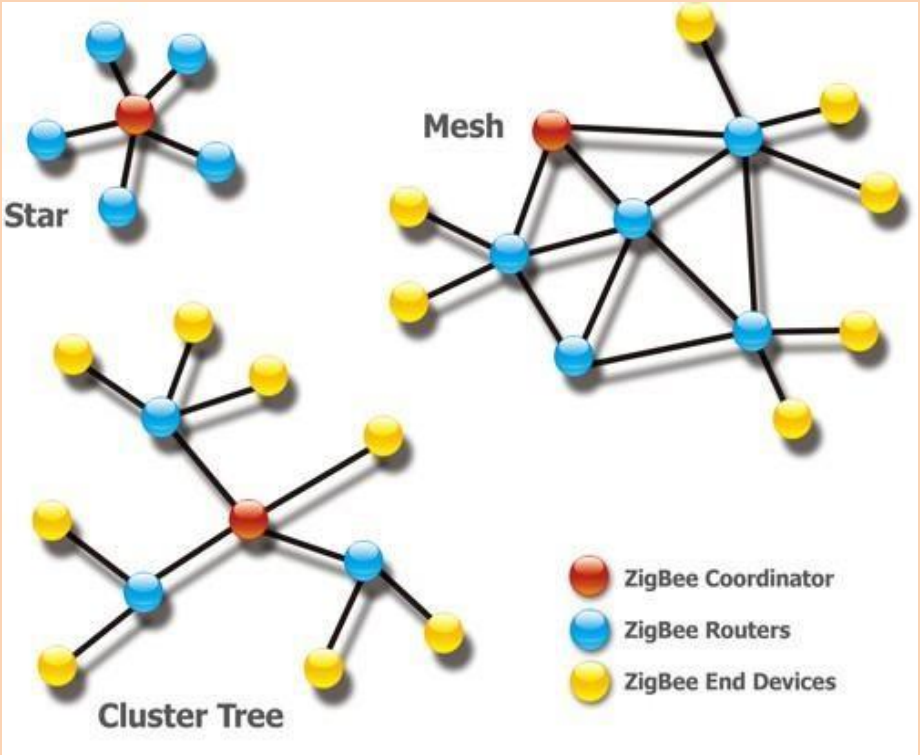


Cassandra is a robust solution for those requiring a reasonably consistent, highly available, and scalable fault-tolerant data store. Cassandra is also a great solution for those migrating from relational databases to No SQL due to the Cassandra Query Language, which is essentially a subset of SQL, making Cassandra more accessible than competitors. Cassandra maintains itself as a leader in speed and efficiency within the No SQL domain, so if the goal is to create an application with intensive and quick reads and writes, then Cassandra is the ideal solution.

A. Swathi,3rd cse,(188T1A0501)

ZigBee Technolgy

ZigBee is the name of a specification for a suite of high level communication protocols using small, low-power digital radios. The technology is intended to be simpler and cheaper than other WPANs such as Bluetooth. The most capable ZigBee node type is said to require only about 10% of the software of a typical Bluetooth or Wireless Internet node. The estimated cost of the radio for a ZigBee node is about $1.10 to the manufacturer in very high volumes. Most ZigBee solutions require an additional microcontroller driving the price further up at this time.
ZigBee is the newest and provides specifications for devices that have low data rates, consume very low power and are thus characterized by long battery life. Other standards like Bluetooth and IrDA address high data rate applications such as voice, video and LAN communications.



The target networks encompass a wide range of devices with low data rates in the Industrial, Scientific and Medical (ISM) radio bands, with building-automation controls like intruder/fire alarms, thermostats and remote (wireless) switches, video/audio remote controls likely to be the most popular applications. So far sensor and control devices have been marketed as proprietary items for want of a standard. With acceptance and implementation of ZigBee, interoperability will be enabled in multi-purpose, self- organizing mesh networks.

When you hold the TV remote and wish to use it you have to necessarily point your control at the device. This one-way, line-of-sight, short-range communication uses infrared (IR) sensors to enable communication and control and it is possible to operate the TV remotely only with its control unit. Add other home theatre modules, an air- conditioner and remotely enabled fans and lights to your room, and you become a juggler who has to handle not only these remotes, but also more numbers that will accompany other home appliances you are likely to use. Some remotes do serve to control more than one device after „memorizing' access codes, but this interoperability is restricted to LOS, that too only for a set of related equipment, like the different units of a home entertainment system.

Now picture a home with entertainment units, security systems including fire alarm, smoke detector and burglar alarm, air-conditioners and kitchen appliances all within whispering distance from each other and imagine a single unit that talks with all the devices, no longer depending on line-of-sight, and traffic no longer being one-way. This means that the devices and the control unit would all need a common standard to enable intelligible communication. ZigBee is such a standard for embedded application software.

N.Yeshwanth

(188T1A0542)

2nd CSE-A

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